

HYPOCONCHA PARASITICA (LINNAEUS, 1763),
A SENIOR SYNONYM OF *HYPOCONCHA SABULOSA*
(HERBST, 1799) (CRUSTACEA: DECAPODA: BRACHYURA)

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Abstract.—*Hypoconcha parasitica* (Linnaeus, 1763) is the oldest available name for the species now known as *Hypoconcha sabulosa* (Herbst, 1799).

The identity of *Cancer parasiticus* Linnaeus, 1763, almost always indicated by its invalid junior synonym *Cancer pinnophylax* Linnaeus, 1767, has puzzled several authors. Especially in the 18th and the first third of the 19th centuries efforts were made to place the species in the system of the Brachyura. It was considered to be either a dorippid or a pinnotherid, but in almost all cases its identity was considered dubious. After 1830 the name virtually disappeared from the carcinological literature. In 1837 H. Milne Edwards cited *Cancer pinnophylax* Linnaeus, 1767, in the synonymy of *Dorippe astuta* Fabricius, 1798, ignoring its priority. Schmitt, McCain, and Davidson (1973:53, 56), in their review of the pinnotherid literature, dealt with the species under *Pinnotheres maculatus* Say, 1818, but came to the conclusion that Linnaeus' species was unidentifiable.

In a recent review of the subfamily Dorippinae, family Dorippidae (Holthuis and Manning, in preparation), we encountered the problem of *Cancer parasiticus* versus *Cancer pinnophylax*. A study of the literature led us to believe that we have found its correct solution.

The original description of *Cancer parasiticus*, based on material from America, was published by Linnaeus (1763:415) in the thesis of his pupil Boas Johansson. The text is as follows:

"CANCER *parasiticus* brachyurus, thorace inaequali orbiculato ciliato, pedibus dorsalibus quatuor.

"*Habitat in America intra Camam laz- arum D. D. Jaquin. Testa magnitudine dimidii imperialis. Thorax orbiculatus, integerimus, convexus, cinereus, laevis, subinaequalis tuberculis paucis minutissimis. In Dorso pedes 4 minores; ungvibus duobus aduncis. Pedes subtus 4 praeter manus. Cauda inflexa brevis.*"

Four years later, Linnaeus (1767:1039) gave the species a new name, *Cancer pinnophylax*, and described it as follows:

"Pinno-
phylax. 5. C[ancer] brachyurus, thorace orbiculato inaequali ciliato, pedibus dorsalibus quatuor. *Amoen.acad.* 6. p. 415.n.93. *Rumph. mus.* 35. Pinnotheres. *Habitat in America intra Chamam Lazarum, D. Jacquin, cuius Pinnotheres & custos est.*"

That the name *Cancer pinnophylax* was intended by Linnaeus (1767) to replace *Cancer parasiticus* is evident from the fact that he referred to the description in *Amoenitates Academicae*. Furthermore, the 1767 description is an abbreviated version of that given in 1763, supplemented by the addition of the reference to Rumphius. However, the account of *Pinnoteres* (not *Pinnotheres*) in Rumphius (1705:25 [not 35]) deals with pontoniid shrimps and pinnotherid crabs from Amboina, Moluccas.

Most subsequent authors of the 18th century (Houttuyn 1769:317; Fabricius 1775:

402; 1781:498; 1787:317; 1793:444; Statius Müller 1775:1100; Gmelin 1789:2964; Olivier 1791:156) copied or translated Linnaeus' description without adding anything new and evidently without having seen any additional material. All used the name *Cancer pinnophylax* for the species, and although most did refer to the paper in the *Amoenitates Academicae*, the name *parasiticus* was not accepted. Like Linnaeus (1767), these authors, under *Cancer pinnophylax*, also gave references to the descriptions of true pinnotherids by pre-Linnaean authors. Herbst (1783:104, pl. 2, fig. 27) in the synonymy of *Cancer pinnophylax* cited not only the above authors but also references to other descriptions of pinnotherids and of dorippids, at the same time remarking that he was not certain that not more than one species was involved. His own illustration was clearly that of a pinnotherid. Fabricius (1798:361), however, cited *Cancer pinnophylax* Linnaeus in the synonymy of his own *Dorippe astuta*, not adopting Linnaeus' name. Bosc (1802:243, pl. 6, fig. 3) placed the species in the Pinnotheridae as *Pinnotheres pinnophylax*, and his figure is a copy of that published by Herbst. Latreille (1803:84) did not agree with Bosc and suggested that Linnaeus' species was "plus voisin des dorippes." As already mentioned above, H. Milne Edwards (1837:157) followed Fabricius in considering *Cancer pinnophylax* a synonym of *Dorippe astuta*. This was practically the last that was heard of Linnaeus' species until Schmitt, McCain, and Davidson (1973) again discussed it. Rathbun (1918:66) meanwhile had assigned Bosc's (1802) material of *Pinnotheres pinnophylax*, but not the material of Linnaeus, with considerable doubt to *Pinnotheres ostreum* Say, 1817.

It seems clear that authors like Herbst and Bosc, who identified *Cancer pinnophylax* with a pinnotherid, were led to this conclusion by Linnaeus' description of the carapace as circular, smooth and convex, and the fact that the animals were said to live

in bivalve shells. However, the dorsal position of the last two pairs of legs and the fact that these legs end in two hook-shaped claws is evidence against the pinnotherid nature of the species. The position of the last two pairs of legs evidently suggested to Fabricius, Latreille, and H. Milne Edwards that the species was closer to the dorippids, although these do not have circular, smooth, convex bodies and do not live in shells, although some species certainly do carry them around.

In our opinion, the only genus that fits Linnaeus' description is the dromiid *Hypoconcha*. In *Hypoconcha* the outline of the body is circular (orbiculato); the front of the carapace is semicircularly rounded and although the lateral margins may be straight or even concave, they are covered by the last two pairs of legs in such a way that the whole is more or less circular. The dorsal surface of the carapace is smooth (laevis), uneven (subinaequalis or inaequalis) and convex; the lateral margin has no teeth (integerrimus), only a few widely placed tubercles (tuberculis paucis minutissimus). Also the margin of the carapace is conspicuously ciliated, bearing a fringe of long hairs (ciliato). The last two pairs of legs of *Hypoconcha* are turned dorsally and are shorter than the other legs (in dorso pedes 4 minores); they each end in two sharp, hook-shaped claws (unguibus duobus aduncis). This leaves on the ventral side two pairs of long pereopods next to the cheliped (pedes subtus 4 praeter manus). *Hypoconcha* holds with its last legs the shell of a bivalve into which it can retract itself. Although no species of *Hypoconcha* has been reported to carry a shell of *Chama*, the shape of these shells is such that to find *Hypoconcha* using a valve of *Chama* is a real possibility. The bivalve mentioned by Linnaeus, *Chama lazarus* Linnaeus, is an Indo-West Pacific species, and it is therefore more likely that the shell in which *Cancer parasiticus* was found is the American *Chama macerophylla* Gmelin, as already pointed out by

Rathbun (1918:66) and Schmitt, McCain, and Davidson (1973:56); also, there is the possibility that Linnaeus (or Jacquin) misidentified the genus.

The size of the carapace (testa) of *Cancer parasiticus* was given by Linnaeus as "magnitudine dimidii imperialis." The word "imperialis" probably is a typographical error for "imperialis," and undoubtedly refers to the Russian gold coin, the imperial, which was first issued in 1745 during the reign of Empress Elisabeth Petrovna, daughter of Peter the Great, who was born in 1709 and reigned from 1741 to 1762. The value of the gold imperial is 10 rubles, that of the half-imperial being 5 rubles. The dutch translation of Linnaeus' description by Houttuyn (1769:312) indicates its size as follows: "De Schaal heeft de grootte van een halve Ryksdaalder" (The shell has the size of a half rijksdaalder) (the latter is sometimes translated as rix dollar). The German translation by Stadius Müller (1775:1100) runs as follows: "Das ganze rauhaarige Schild ist nicht grösser als ein Achtgroschenstück."

We are indebted to the coin dealer from Amsterdam, Messrs. Jacques Schulman, for the information that the diameter of a half imperial (a gold five ruble piece, first coined in 1753) is 26 mm.

The type of *Cancer parasiticus* was collected in America by "D. D. Jaquin." Jaquin is, without any doubt, Nicolas Joseph Jacquin (born Leiden, The Netherlands, 16 February 1727—died Vienna, Austria, 24 October 1817), who was appointed imperial botanist at the Austrian court in 1752, and who between 1754 and 1759 made a botanical expedition to America, in the course of which evidently he obtained the specimen of *Cancer parasiticus* that he sent to Linnaeus.

Although there can be little doubt that Linnaeus' species is a *Hypoconcha*, it is more difficult to determine which species he had before him. As Jacquin collected mainly or exclusively in the West Indies, his speci-

mens can belong only to one of the three western Atlantic species: *Hypoconcha sabulosa* (Herbst, 1799), *H. arcuata* Stimpson, 1858, or *H. spinosissima* Rathbun, 1933. This latter species is conspicuously spinous and lives in deeper water than the others so it is less likely to have been found by Jacquin. The best known of the three western Atlantic species is *H. sabulosa*; it has long been known from the West Indies. Rathbun (1937:44) cited the description and illustration of it made by P. Nicolson based on a specimen from Santo Domingo and published in 1776. *Hypoconcha sabulosa* is characterized by the presence of "three large granulated tubercles on either side of ventral surface of carapace" (Rathbun 1937:44).

Of interest here is the fact that Herbst (1783:104), when describing *Cancer pinophylax* Linnaeus ("Der Linnéische Pinnewächter"), ended the German translation of Linnaeus' description with the words "die Scheeren sind grade, und haben an der Seite drey Punkte" (the chelae are straight and have laterally three points), which might very well refer to the three granulated tubercles characteristic of *Hypoconcha sabulosa*. We have not been able to find these characters mentioned in any of Linnaeus' descriptions of *Cancer parasiticus* or *C. pinophylax* and we do not know where Herbst got his information. If the observation is correct, there can be little doubt that *Cancer parasiticus* is conspecific with *Hypoconcha sabulosa*.

There is another piece of circumstantial evidence supporting this supposition. Herbst (1799:57), when describing his *Cancer sabulosus*, mentioned that he had found his specimen in the Imperial collection of Austria in Vienna. It is not unlikely that Jacquin, before sending a specimen of *Hypoconcha sabulosa* to Linnaeus, placed material of the same species first in the Imperial collection of Austria, and that Herbst had seen one of those specimens.

In summary we can say that there is not

the slightest doubt that *Cancer parasiticus* (and thus *C. pinnophylax*) is a species of *Hypoconcha*, as Linnaeus' description does not fit any other genus. Furthermore it is most likely that it is a senior synonym of *Cancer sabulosus* Herbst as (1) that species was known to collectors in the 18th century and evidently could be obtained without any special equipment, (2) Linnaeus' description fits the species, even to size, and, if Herbst's observation that the type has three points near the chelae is correct, there can be no doubt of its conspecificity with *C. sabulosus*, and (3) there seems to be a good possibility that the types of *Cancer parasiticus* and *C. sabulosus* came from a single lot, collected by N. J. Jacquin for the Imperial Austrian collection in Vienna.

In order to settle the identity of *Cancer parasiticus*, we here select a male specimen (carapace length 23.2 mm, carapace width, 22.4 mm; larger of 2 males in lot) taken in the channel between White Shoal and Loggerhead Key, Tortugas, Florida, 9.5 fms (=17 m), 21 June 1931, leg. Waldo L. Schmitt to be the neotype of *Cancer parasiticus* Linnaeus, 1763 and of *Cancer pinnophylax* Linnaeus, 1767. The specimen agrees completely with M. J. Rathbun's description (1937:45) of *Hypoconcha sabulosa* (Herbst, 1799); it was figured by her (1937) on pl. 8, figs. 3, 4. It is housed in the collection of the National Museum of Natural History, Smithsonian Institution, Washington, D.C., under catalogue number USNM 66796.

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